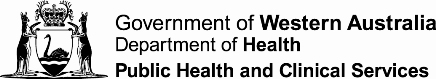
Foodborne disease surveillance and outbreak investigations in Western Australia, first quarter 2018

**Enhancing foodborne disease surveillance across Australia**



**Communicable Disease Control Directorate**



OzFoodNet, Communicable Disease Control Directorate

**Acknowledgments**

Acknowledgement is given to the following people for their assistance with the activities described in this report: the staff from PathWest Laboratory Medicine WA; Mr John Coles and other staff from the Environmental Health Directorate of the Department of Health, Western Australia; Public Health Nurses from the metropolitan and regional Population Health Units; and Local Government Environmental Health Officers.

**Contributors/Editors**

Nevada Pingault, Ben Witham, Darren Westphal, Barry Combs and Niki Foster

Communicable Disease Control Directorate

Department of Health, Western Australia

PO Box 8172

Perth Business Centre

Western Australia 6849

Email: [OzfoodnetWA@health.wa.gov.au](mailto:OzfoodnetWA@health.wa.gov.au)

Telephone: (08) 9222 2486

Facsimile: (08) 9222 0227

Web:

OzFoodNet WA Health

https://ww2.health.wa.gov.au/Articles/F\_I/Infectious-disease-data/Enteric-infection-reports-and-publications-OzFoodNet

OzFoodNet Department of Health

[www.ozfoodnet.gov.au/](http://www.ozfoodnet.gov.au/)

**Disclaimer**:

Every endeavour has been made to ensure that the information provided in this document was accurate at the time of writing. However, infectious disease notification data are continuously updated and subject to change.

This publication has been produced by the **Department of Health, Western Australia**.

# Executive summary

During the first quarter of 2018 (1Q18), the Western Australian (WA) OzFoodNet team conducted surveillance of enteric diseases, undertook investigations into outbreaks and was involved with ongoing enteric disease research projects. The most common notifiable enteric infections in WA were campylobacteriosis (n=820), salmonellosis (n=620), rotavirus infection (n=79) and shigellosis (n=78) (Figure 1). Compared to the applicable 5-year first quarter means (1QM), there were increases in notifications of campylobacteriosis (22%), salmonellosis (10%) and shigellosis (165%). The increase in shigellosis was primarily driven by an increase in *S. flexneri* 2Bnotifications. There were eight foodborne outbreaks investigated in the first quarter, all due to *Salmonella* Typhimurium, which was 1.6 times the 1QM (n=5). OzFoodNet also conducted surveillance of 28 non-foodborne outbreaks. Of these, the most common mode of transmission was person-to-person (25 outbreaks), with a total of 524 people ill. Norovirus was the most commonly reported pathogen in these outbreaks (n=15, 60%).

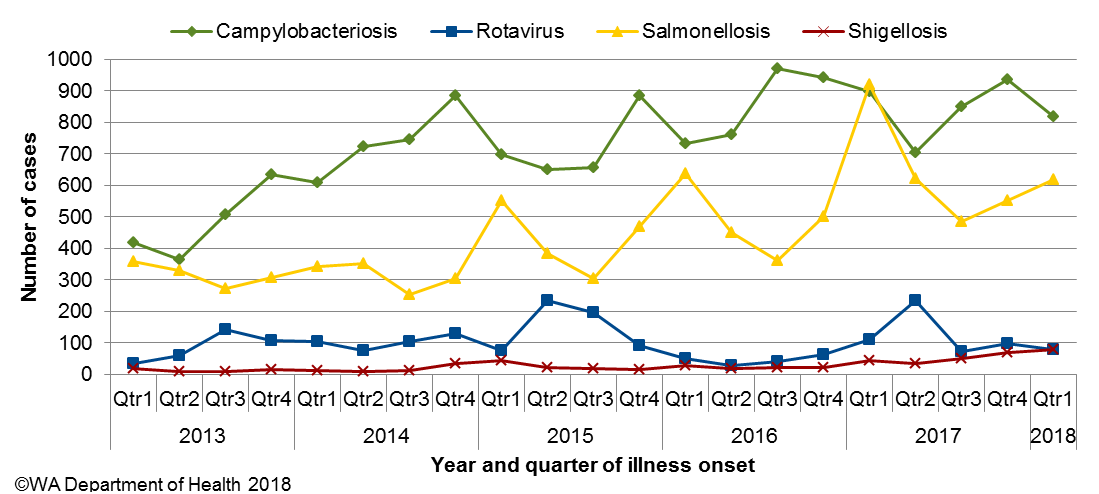


Figure 1: Notifications of the four most common enteric diseases by quarter from 2013 to 2018, WA

**Table of Contents**

[Executive summary 2](#_Toc531178596)

[1 Introduction 5](#_Toc531178597)

[2 Incidence of notifiable enteric infections 6](#_Toc531178598)

[2.1. Methods 6](#_Toc531178599)

[2.2. Campylobacteriosis 6](#_Toc531178600)

[2.3. Salmonellosis 7](#_Toc531178601)

[2.4. Rotavirus infection 8](#_Toc531178602)

[2.5. Shigellosis 9](#_Toc531178603)

[2.6. Other enteric diseases and foodborne illness 10](#_Toc531178604)

[3 Foodborne and probable foodborne disease outbreaks 12](#_Toc531178605)

[3.1. Private residence, *Salmonella* Typhimurium (outbreak code 042-2017-042) 13](#_Toc531178606)

[3.2. Family, *Salmonella* Typhimurium (outbreak code 042-2018-001) 13](#_Toc531178607)

[3.3. Restaurant, *Salmonella* Typhimurium (outbreak code 042-2018-002) 13](#_Toc531178608)

[3.4. Bakery, *Salmonella* Typhimurium (outbreak code 042-2018-003) 14](#_Toc531178609)

[3.5. Restaurant, *Salmonella* Typhimurium (outbreak code 042-2018-004) 14](#_Toc531178610)

[3.6. Restaurant, *Salmonella* Typhimurium (outbreak code 042-2018-005) 14](#_Toc531178611)

[3.7. Restaurant, *Salmonella* Typhimurium (outbreak code 042-2018-006) 15](#_Toc531178612)

[3.8. Family, *Salmonella* Typhimurium (outbreak code 042-2018-007) 15](#_Toc531178613)

[4 Cluster investigations 16](#_Toc531178614)

[4.1. *Salmonella* Typhimurium MLVA 03-17-09-12-523 16](#_Toc531178615)

[4.2. STEC 17](#_Toc531178616)

[4.3. *Listeria* 18](#_Toc531178617)

[4.4. *Salmonella* Kentucky 18](#_Toc531178618)

[4.5. *Salmonella* Muenchen 18](#_Toc531178619)

[4.6. *Salmonella* Saintpaul 18](#_Toc531178620)

[4.7. *Salmonella* Singapore 19](#_Toc531178621)

[4.8. *Salmonella* Hvittingfoss 19](#_Toc531178622)

[5 Non-foodborne disease outbreaks and outbreaks with an unknown mode of transmission 19](#_Toc531178623)

[5.1 Person-to-person outbreaks 20](#_Toc531178624)

[5.2 Outbreaks with unknown mode of transmission 20](#_Toc531178625)

[5.2.1 Restaurant (outbreak code 02/18/SIR) 20](#_Toc531178626)

[5.3 Probable environmental disease outbreak 21](#_Toc531178627)

[5.3.1 Restaurant, norovirus (outbreak code 03/18/WWW) 21](#_Toc531178628)

[5.3.2 Restaurant, norovirus (outbreak code 03/18/WWP) 21](#_Toc531178629)

[6 Site activities 22](#_Toc531178630)

[7 References 23](#_Toc531178631)

**List of Tables**

[Table 1: Number of campylobacteriosis notifications, 1st quarter 2018, WA, by region 7](#_Toc531178588)

[Table 2: Number of salmonellosis notifications, 1st quarter 2018, WA, by region 7](#_Toc531178589)

[Table 3: Number of rotavirus notifications, 1st quarter 2018, WA, by region 8](#_Toc531178590)

[Table 4: Number of shigellosis notifications, 1st quarter 2018, WA, by region 10](#_Toc531178591)

[Table 5: Summary of number of notified cases of enteric notifiable diseases in WA in the first quarter 2018 compared to historical means 12](#_Toc531178592)

[Table 6: Outbreaks with non-foodborne transmission, 1st Quarter 2018, WA 19](#_Toc531178593)

**List of Figures**

[Figure 1: Notifications of the four most common enteric diseases by quarter from 2013 to 2018, WA 2](#_Toc531178594)

[Figure 3: Notifications of *Salmonella* Typhimurium MLVA 03-17-09-12-523 in WA, 2016 to March 2018 17](#_Toc531178595)

**Notes:**

1. All data in this report are provisional and subject to future revision.
2. To help place the data in this report in perspective, comparisons with other reporting periods are provided. As no formal statistical testing has been conducted, some caution should be taken with interpretation.

Copyright to this material is vested in the State of Western Australia unless otherwise indicated. Apart from any fair dealing for the purposes of private study, research, criticism or review, as permitted under the provisions of the Copyright Act 1968, no part may be reproduced or re-used for any purposes whatsoever without written permission of the State of Western Australia.

# Introduction

It has been estimated that there are 5.4 million cases of foodborne illness in Australia each year at a cost of $1.2 billion per year1. This is likely to be an underestimate of the total burden of gastrointestinal illness as not all enteric infections are caused by foodborne transmission. Other modes of transmission such as person-to-person, animal-to-person and waterborne transmission are also very important pathways for acquiring enteric infections. Most enteric infections are preventable through interventions at the level of primary production, institution infection control and food handling and hand hygiene at food businesses and in households.

This report describes enteric disease surveillance and investigations carried out during the first quarter of 2018 by OzFoodNet WA, other Western Australian Department of Health (WA Health) agencies and local governments. Most of the data are derived from reports by doctors and laboratories to WA Health of 16 notifiable enteric diseases. In addition, outbreaks caused by non-notifiable enteric infections are also documented in this report, including norovirus, which causes a large burden of illness in residential (mostly aged) care facilities (RCF) and the general community.

OzFoodNet WA is part of the Communicable Disease Control Directorate (CDCD) within WA Health, and is also part of the National OzFoodNet network funded by the Commonwealth Department of Health2. The mission of OzFoodNet is to enhance surveillance of foodborne illness, including investigating and determining the cause of outbreaks. OzFoodNet also conducts applied research into associated risk factors and develops policies and guidelines related to enteric disease surveillance, investigation and control. The OzFoodNet site based in Perth is responsible for enteric disease surveillance and investigation in WA.

OzFoodNet WA regularly liaises with staff from: Public/Population Health Units (PHUs); the Environmental Health Directorate of WA Health (EHD); and the Food Hygiene, Diagnostic and Surveillance laboratories at PathWest Laboratory Medicine WA.

PHUs are responsible for a range of public health activities, including communicable disease control, within their respective administrative regions. The PHUs monitor RCF gastroenteritis outbreaks and provide infection control advice. The PHUs also conduct follow-up of sporadic cases of important enteric diseases including typhoid, paratyphoid and hepatitis A.

The EHD liaises with Local Government (LG) Environmental Health Officers (EHO) during the investigation of food businesses. PathWest Laboratory Medicine WA provides public health laboratory services for the surveillance and investigation of enteric disease.

# Incidence of notifiable enteric infections

## Methods

Enteric disease notifications were extracted from the Western Australian Notifiable Infectious Diseases Database (WANIDD) by optimal date of onset (ODOO) for the time period 1st January 2013 to 31st March 2018. The ODOO is a composite of the ‘true’ date of onset provided by the notifying doctor or obtained during case follow-up, the date of specimen collection for laboratory notified cases, and when neither of these dates is available, the date of notification by the doctor or laboratory, or the date of receipt of notification, whichever is earliest. Rates were calculated using estimated resident population data for WA from Rates Calculator version 9.5.5.1 (WA Health, Government of Western Australia), which is based on 2011 census data. Rates in this report were calculated for the first quarter and presented as the rate per 100 000 population per quarter and have not been adjusted for age.

## Campylobacteriosis

Campylobacteriosis was the most commonly notified enteric disease in WA during the first quarter of 2018 (1Q18), with 820 notifications and a rate of 30 cases per 100 000 population (Table 1). There was a 22% increase in campylobacteriosisnotifications in the 1Q18 compared with the 5-year first quarter mean (1QM) of 671 notifications. The increase appeared to be due to sporadic disease, as there were no identified *Campylobacter* outbreaks during the 1Q18. Similar to previous quarters, at least some of the increase is likely to be due to the introduction of polymerase chain reaction (PCR) testing of faecal specimens by one large private pathology laboratory in 2014, and another private laboratory in 2016, which has greater sensitivity than culture techniques.

The place of acquisition of infection was reported for 56% (n=456) of cases, of which 72% (n=328) were locally acquired and 26% (n=120) were acquired overseas.

Table 1: Number of campylobacteriosis notifications, 1st quarter 2018, WA, by region



**\***Percentage change in the number of notifications in the current quarter compared to the historical 5-year mean for the same quarter. Positive values indicate an increase when compared to the historical 5-year mean of the same quarter. Negative values indicate a decrease when compared to the historical 5-year mean of the same quarter. Percentage change should be interpreted with caution when the number of cases is small.

## Salmonellosis

Salmonellosis was the second most commonly notified enteric disease in WA in the 1Q18, with 620 notifications and a rate of 22 cases per 100 000 population (Table 2). The number of salmonellosisnotifications in the 1Q18 was 10% higher than the 1QM (n=561).

Place of acquisition of infection was reported for 80% (n=494) of cases, of which 80% (n=397) were locally acquired, 18% (n=90) were acquired overseas and 1% (n=7) were acquired interstate.

The most commonly reported *Salmonella* serotype was *S*. Typhimurium (STM) (n=303, 49%), and of those cases with information on place of acquisition (n=255, 84%), 94% of cases (n=239) were locally acquired. Multi locus variable number tandem repeat analysis (MLVA) is used to subtype STM in WA. The most common MLVA types for 1Q18 were 03-17-09-12-523 (n=111, 37%), 03-17-10-12-523 (n=17, 6%) and 03-17-09-11-523 (n=12, 4%). The MLVA type 03-17-09-12-523 emerged in the 4Q16 and has been associated with a number of point source outbreaks (Sections 3 and 4).

Table 2: Number of salmonellosis notifications, 1st quarter 2018, WA, by region



**\***Percentage change in the number of notifications in the current quarter compared to the historical 5-year mean for the same quarter. Positive values indicate an increase when compared to the historical 5-year mean of the same quarter. Negative values indicate a decrease when compared to the historical 5-year mean of the same quarter. Percentage change should be interpreted with caution when the number of cases is small.

NA: not applicable as there is a 0 value in the calculation for the 4th quarter % change

*S*. Enteritidis was the second most common *Salmonella* serotype (n=41, 7%), with most (n=38, 93%) cases acquired overseas, primarily after travel to Indonesia (n=26, 68%), and almost exclusively to Bali.

*Salmonella* Saintpaulwas the third most common serotype (n=25), and of those cases with known place of acquisition, 91% of cases were acquired in WA. The investigation into *S.* Saintpaul is described in Section 4.6.

There were 40 notifications of *Salmonella* that had no serotype. Most (58%) of these notifications were from one laboratory that first uses PCR screening for enteric pathogens. Specimens that are subsequently culture negative remain as a “PCR only” notification.

## Rotavirus infection

In the 1Q18 there were 79 notifications of rotavirus infection (2.9 cases per 100 000 population), a 6% decrease compared to the 1QM (Table 3). While in most regions there was a decrease in rotavirus infections notified during 1Q18, there was a modest increase in notifications in the metropolitan area. On a statewide basis, of the cases with known Aboriginality status (n=70, 89%), 99% were non-Aboriginal and 1% were Aboriginal people. The median age was 19 years (range <1 years to 83 years).

Table 3: Number of rotavirus notifications, 1st quarter 2018, WA, by region



\*Percentage change in the number of notifications in the current quarter compared to the historical 5-year mean for the same quarter. Positive values indicate an increase when compared to the historical 5-year mean of the same quarter. Negative values indicate a decrease when compared to the historical 5-year mean of the same quarter. Percentage change should be interpreted with caution when the number of cases is small.

NA: not applicable as there is a 0 value in the calculation for the 1st quarter % change

## Shigellosis

In the 1Q18 there were 78 culture confirmed shigellosis notifications (3 cases per 100 000 population), a 165% increase compared to the 1QM (Table 4). The place of acquisition of infection was reported for 90% (n=70) of cases, and of these, 79% (n=55) were acquired in WA. Of the 78 notified cases, 45 (59%) were Aboriginal people and 33 (41%) were non-Aboriginal people. The median age was 26 years (range 1 year to 78 years).

*Shigella flexneri* was the most commonly notified species (n=56; 67%), with 49 cases of *S. flexneri* 2b, five cases of *S. flexneri* 2a and one case each of *S. flexneri* 1a and 3b. There were 21 cases of *S. sonnei*, including 16 *S. sonnei* biotype G, four *S. sonnei* biotype A and one *S. sonnei* biotype F. There was also one culture-positive case notified as *Shigella* species. The largest increases were in the remote rural regions of the Kimberley (n=26), Goldfields (n=11) and Pilbara (n=8). Most (95%) of these cases were diagnosed with *Shigella flexneri* 2B (n=42). Increases in S. *flexneri* 2B were also reported in South Australia (SA) and the Northern Territory (NT). The Pilbara and Kimberley PHUs distributed an alert to local health providers in January in response to the *Shigella* increase in these regions. Alerts had also been distributed by the Kimberley and Goldfields PHUs in 2017.

Table 4: Number of shigellosis notifications, 1st quarter 2018, WA, by region



**\***Percentage change in the number of notifications in the current quarter compared to the historical 5-year mean for the same quarter. Positive values indicate an increase when compared to the historical 5-year mean of the same quarter. Negative values indicate a decrease when compared to the historical 5-year mean of the same quarter. Percentage change should be interpreted with caution when the number of cases is small.

NA: not applicable as there is a 0 value in the calculation for the 1st quarter % change

## Other enteric diseases and foodborne illness

During the 1Q18, other enteric disease notifications included:

* **Cryptosporidiosis:** In the 1Q18 there were 39 cryptosporidiosis notifications (1.4 cases per 100 000 population), a 72% decrease compared to the 1QM (Table 5). The place of acquisition of infection was reported for 59% (n=23) of cases of which 61% (n=14) were locally acquired.
* **Hepatitis A infection:** Two locally-acquired hepatitis A cases were notified in 1Q18. One case had genotype IA and had spent part of their incubation period interstate, the other case had genotype IB and was locally acquired.
* **Listeriosis:** There were three notifications for listeriosis during 1Q18, all of which were locally acquired. A summary of the investigation into these cases is in Section 4.
* **Yersiniosis:** There were four cases of culture-positive yersiniosis notified in 1Q18. Two cases acquired their illness in WA and the other two had incomplete travel information such that the place of acquisition could not be ascertained.
* **Shiga toxin producing *E. coli* (STEC):** There were 23 cases notified in 1Q18 compared to five cases for the 1QM. Prior to 2016, STEC was diagnosed by culture only at only one WA laboratory and <1 to 2 cases were notified each year. The increase in cases in subsequent reporting periods, as well as 1Q18, was likely due to the introduction in 2016 by this one laboratory of PCR testing for STEC on stool samples with bloody diarrhoea (macroscopic or history), and introduction of PCR testing at another laboratory on any stool sample if requested by the doctor. The 23 cases included 12 (52%) females and 11 (48%) males, ranging in age from <1-90 years (median 28 years). Three cases could not be contacted. Of the remaining 20 cases, 19 cases had an acute illness with a specific onset date and ten cases reported bloody diarrhoea. One case had no acute illness, but had ongoing gastrointestinal issues for the previous two years. Eight cases with acute illness had travelled overseas during their incubation period, three to Indonesia, one each to Vietnam and Myanmar, two to South Africa and one to India, while the remaining 11 cases were locally acquired.
* **Paratyphoid fever:** There were two cases of paratyphoid fever (phage type 4var1 and 1) notified in 1Q18. Both had travelled to India during their incubation period .
* **Typhoid fever:** There were 8 cases of typhoid fever notified in the 1Q18. Six cases had travelled to India during their incubation period (phage type E1 [n=2], E10 [n=1], E14 [n=1], untypable [n=2]) and one case had travelled to Bangladesh (phage type E9). The remaining case was epidemiologically linked to a 4Q17 case who had travelled to Iraq during their incubation period.
* ***Vibrio parahaemolyticus*:** There were four notifications of *Vibrio parahaemolyticus* in 1Q18. Two cases acquired their infection overseas in Vietnam and one in Mauritius. The remaining case had the organism isolated from a sputum specimen and was locally acquired with no obvious source of infection.

There were no notifications of botulism, cholera, HUS or hepatitis E in the 1Q18.

Table 5: Summary of number of notified cases of enteric notifiable diseases in WA in the first quarter 2018 compared to historical means



\*Percentage change in the number of notifications in the current quarter compared to the historical 5-year mean for the same quarter. Positive values indicate an increase when compared to the historical 5-year mean of the same quarter. Negative values indicate a decrease when compared to the historical 5-year mean of the same quarter. Percentage change should be interpreted with caution when the number of cases is small.

NA: not applicable as there is a 0 value in the calculation for the 1st quarter % change

# Foodborne and probable foodborne disease outbreaks

There were nine foodborne or probable foodborne outbreaks identified and investigated in this quarter, including cases investigated as part of a national outbreak investigation. The number of foodborne outbreaks in the 1Q18 was 1.8 fold higher than the 1QM (n=5).

## Private residence, *Salmonella* Typhimurium (outbreak code 042-2017-042)

Of an extended family of eight staying together over the Christmas period, six became ill with gastroenteritis. Three had onset dates between 24/12/17 (n=2) and 25/12/17 (n=1) and all three were diagnosed with STM MLVA 03-17-09-12-523. All three cases had diarrhoea with median diarrhoea duration of 7 days and two had bloody diarrhoea. All three cases were hospitalised. The family shared a number of meals together during their incubation period, including a pineapple soufflé prepared and consumed on 23/12/17 by four members of the family including the three cases. The pineapple soufflé was made using raw egg at their home. The fourth person who ate the soufflé and two other family members staying at the house who did not eat the dessert became ill with gastroenteritis symptoms on the 1/1/18, which may be due to secondary transmission. No environmental investigation was undertaken because the outbreak setting was a private residence. The vehicle was unknown and the mode of transmission was probable foodborne.

## Family, *Salmonella* Typhimurium (outbreak code 042-2018-001)

An extended family of 13 people from five different households attended a private Christmas dinner and six became ill during their incubation period, with three diagnosed with STM MLVA 03-17-09-12-523. The six ill people lived in three different households. All cases had diarrhoea and the median diarrhoea duration was 13 days. The median incubation period was 2.4 days. Food served at the dinner included roast turkey, roast ham, macaroni and cheese, roast potato, pumpkin and carrots, peas and corn, Yorkshire pudding, custard, pavlova (store bought) with cream and fruit, fruit salad and fruit juice. No specific food was implicated and there was no leftover food for testing. Mode of transmission was probable foodborne.

## Restaurant, *Salmonella* Typhimurium (outbreak code 042-2018-002)

Five of seven people in two independent groups became ill will gastroenteritis symptoms after dining at the same restaurant on the evening of 31/12/17. Three people (two from Group 1 and one from the Group 2) were diagnosed with STM MLVA 03-17-10-12-523. Onset of illness for cases was 1/1/18-2/1/18. Two people were hospitalised. A variety of foods were eaten by ill people. No entrees or desserts were eaten. While the environmental investigation identified that raw egg sauces were used at the restaurant, cases did not identify eating meals that would have contained the raw eggs. Samples of eggs and raw egg sauces collected from the restaurant were negative for *Salmonella*. The vehicle was unknown and the mode of transmission was probable foodborne.

## Bakery, *Salmonella* Typhimurium (outbreak code 042-2018-003)

Nineteen people in 17 independent groups became ill with gastroenteritis after eating food from a bakery between the 12/1/18 - 30/1/18. Of the 19 cases, 18 were diagnosed with STM MLVA 03-17-09-12-523 and there were eight males and 11 females with a median age of 44 years. The most common symptoms were diarrhoea (19/19), with a median duration of 7 days, fever (19/19) and abdominal pain (12/19). Five people reported bloody diarrhoea and six people were hospitalised as a result of their illness. The median incubation period was 24 hours. The foods most commonly eaten by cases were chicken focaccia or wrap (n=9), Caesar salad (n=6), tuna sandwich (n=3) or ham or beef sandwich (n=1) These foods contained raw egg mayonnaise. The environmental inspection identified the sandwich and salad display fridge on site had a defective thermostat which was not compliant with the Food Act 2008. The implicated mayonnaise and eggs (not the same batch as eaten by cases) were sampled and were negative for *Salmonella*. At the time of sampling the mayonnaise was six days old. Mode of transmission was probable foodborne.

## Restaurant, *Salmonella* Typhimurium (outbreak code 042-2018-004)

Twenty one people in thirteen independent groups became ill with gastroenteritis after eating at a restaurant between the 16/1/18 and 30/1/18. Fifteen cases were diagnosed with STM MLVA 03-17-09-12-523. Of the 21 ill people, nine were male and 12 were female with a median age of 39 years. The most common symptoms were diarrhoea (21/21), with median duration of 7 days, abdominal pain (21/21) and fever (17/18). Six cases reported bloody diarrhoea and five people were hospitalised as a result of their illness. The median incubation period was 40 hours. Cases ate a range of dishes but 14 (67%) had chicken eggs, either a runny fried egg (n=8, 38%) or son-in-law soft boiled egg (n=6, 29%). The environmental investigation found that eggs were not stored in the fridge, staff hand washing was poor and hygiene needed improvement. The implicated food items (not the same batch as eaten by cases) were sampled and were negative for *Salmonella*. Mode of transmission was probable foodborne.

## Restaurant, *Salmonella* Typhimurium (outbreak code 042-2018-005)

Two diagnosed cases of STM MLVA 03-17-09-12-523 from separate households had eaten together at the same restaurant during their incubation period. The cases dined in a group of six at the restaurant on the 10/2/18. A third member of this group also became unwell with gastroenteritis but was not diagnosed. Symptoms included diarrhoea (3/3), with median duration of 14 days, fever (2/3), and abdominal pain (2/3). No cases experienced bloody diarrhoea and none were hospitalised. The median incubation period was 2 days. Meals common to all cases included fried rice, chicken omelette, chicken and sweet corn soup, chicken noodle dish, Kilpatrick oysters, and prawn cutlets. An environmental investigation was conducted by the Local Government. Six food, and four environmental samples collected were all negative for *Salmonella*. A number of compliance issues were identified, including inadequate sanitation processes and possible cross contamination at the food business. The food vehicle was recorded as unknown. Mode of transmission was probable foodborne.

## Restaurant, *Salmonella* Typhimurium (outbreak code 042-2018-006)

Four diagnosed cases of STM MLVA 03-17-09-11-523 from four independent groups had eaten food from the same restaurant on 10/2/18 or 11/2/18, during their incubation period. One of the cases dined with another person who also became unwell with gastroenteritis but was not diagnosed. Of the total five cases, three were male, two were female, and the median age was 5 (range 1-29). The most common symptoms were diarrhoea (5/5) with median duration of 9 days, fever (5/5), abdominal pain (4/4), and bloody diarrhoea (3/5),. One case was hospitalised. The median incubation period was 6 days. A structured questionnaire was completed for four cases (including three diagnosed) and five well people from these groups. Meals commonly eaten by cases included pancakes (3/4), and dishes containing runny poached eggs (3/4), however this was not significantly more than amongst well people (3/5 and 4/5, respectively). An environmental investigation was conducted by the local government and identified issues relating to possible cross-contamination and temperature abuse of high risk foods. Raw whole eggs from a WA producer were used to prepare cooked and uncooked egg products including sauces. Eight food and eight environmental samples were tested for *Salmonella* and all were negative. Transmission was probable foodborne. The food vehicle was recorded as unknown.

## Family, *Salmonella* Typhimurium (outbreak code 042-2018-007)

Three family members from two separate residences became ill with gastroenteritis and two, including one from each household, were diagnosed with STM 03-17-09-12-523. The three cases had onsets on the 18/2/18, 19/2/18 and 20/2/18. All cases had diarrhoea with median diarrhoea duration of 7 days, no cases were hospitalised. The three cases shared a dinner together at a private residence on the 17/2/18 which consisted of a beef dish that had raw eggs cracked on top and lightly cooked before serving. The type and brand of eggs was unknown. A one month old who was the daughter of two of the cases also had a diarrhoeal illness with an onset two days after the mother and was later diagnosed with the outbreak strain. She did not eat any food from the dinner and the illness was suspected to be due to secondary transmission. No environmental investigation was undertaken because the outbreak setting was a private residence. The mode of transmission for the three cases was probable foodborne.

# Cluster investigations

There was one ongoing and seven new cluster investigations during the first quarter of 2018.

## *Salmonella* Typhimurium MLVA 03-17-09-12-523

STM MLVA 03-17-09-12-523 has been under investigation since the type emerged in 2016 following a single case in September 2016 (see 4Q16 report). From September 2016 to March 2018 there were 799 cases notified, including 111 cases in 1Q18 (Figure 3). This MLVA type was the single most common MLVA type notified in 1Q18, constituting 37% of STM notifications for the quarter. Of the 111 cases, 37 (33%) were part of four point source outbreaks investigated in 1Q18 and 3 (3%) were part of two point source outbreak investigated in 2Q18. Two additional outbreaks were investigated in 1Q18 but the onset date of cases was in 4Q17. The six outbreaks investigated in 1Q18 are detailed in Section 3. The remaining 71 cases, comprising 55% males and 45% females, ranged in age from <1 to 91 years (median 32 years), and most (92%) resided in the Perth metropolitan area. Hospitalisation data was confirmed for 57 community cases; 37% were hospitalised.

Raw or undercooked egg dishes were the implicated food vehicle in three of the six point source outbreaks of STM 03-17-09-12-523 investigated in the 1Q18. Two of these point source outbreaks, both occurring at restaurants, reported the use of eggs from the same WA producer. The brand had been linked to this MLVA type in two previous point-source outbreaks where raw or undercooked egg dishes were the implicated food. The third outbreak where an egg dish was implicated occurred at a private residence and the egg brand was unknown. The food vehicle was unknown in the remaining 1Q18 outbreaks of this MLVA type.

Of the 71 cases that were not part of point source outbreaks, 57 were interviewed regarding food and other exposures; 79% had consumed eggs in their incubation period, 18% had not, and 4% were unsure. Of the 33 interviewed cases who only ate eggs at home, 64% could not recall the egg brand that they ate during their incubation period. Several different egg brands were reported by the remaining cases including the egg brand implicated in 1Q18 egg-associated point-source outbreaks. One case reported only eating eggs from backyard chickens. Of the 45 interviewed cases who had consumed eggs in their incubation period, 20% ate eggs outside the home. Note that association via food consumption interviews does not prove causation and these observations need to be considered in the context of other parameters, including the background frequency of egg consumption in the community and the market share of particular brands, along with the findings from the identified point-source outbreaks and non-human sampling and investigation.

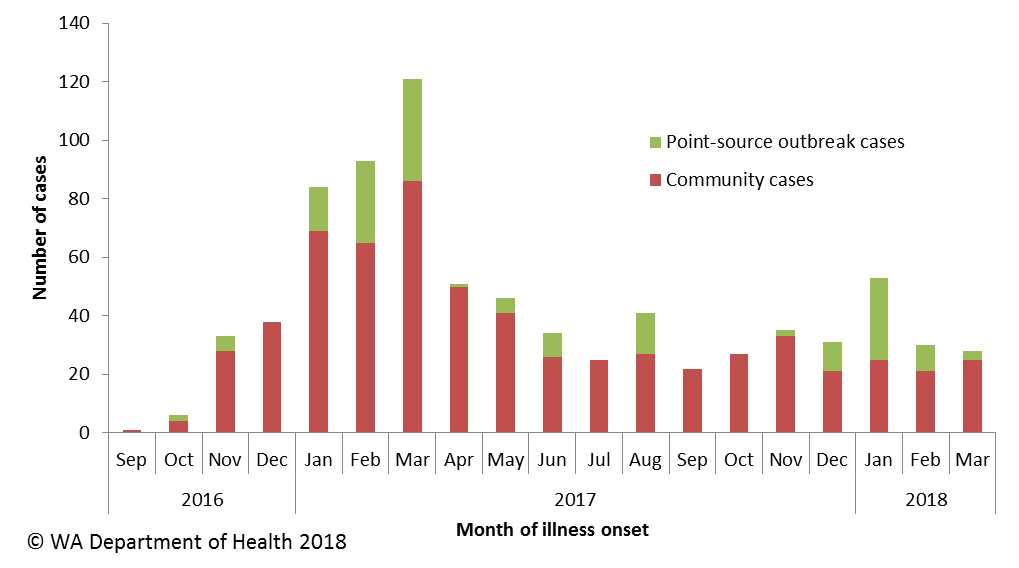


Figure 3: Notifications of *Salmonella* Typhimurium MLVA 03-17-09-12-523 in WA, 2016 to March 2018

## STEC

Seven cases of STEC were notified with onset dates between 1/1/18 and 8/1/18. Cases comprised five females and two males, aged 1-54 years (median 24 years). Five cases were from the metropolitan area, with two cases from the Great Southern region. All cases were interviewed, but a common exposure was not identified. Two cases were acquired overseas. Laboratory testing did not support a common exposure for the cases. Three cases were serotyped as O157:H7, but PFGE analysis of isolates from two of these cases identified distinct PFGE patterns. Samples from three cases were culture negative and further confirmatory testing was not able to be conducted on the remaining sample.

## *Listeria*

Three cases of *Listeria* were notified with onset dates of 1/2/18, 2/2/18 and 15/2/18. Cases were all male, aged 64, 84 and 85 years. All cases were interviewed, but a common exposure was not identified. PFGE and whole genome sequencing was performed on the isolates from the three cases and all were different, indicating a common exposure for the three cases was unlikely.

## *Salmonella* Kentucky

From January to February 2018 there were eight cases (63% male and 37% female, median age 43 years) of *S.* Kentucky notified, compared to the historic five-year average of two for the same period. Most cases resided in the east (50%, n=4) and north (25%, n=2) metropolitan areas. Two cases had a known travel history. Three of the remaining six cases were interviewed but none had recently travelled and no common food businesses were identified. No hypothesis for the cause of illness could be established.

## *Salmonella* Muenchen

In February 2018 there were six cases (33% male and 67% female, median age 28 years) of *S*. Muenchen notified, compared to the historic five-year average of two for the month. Cases were geographically dispersed (South Metro n=2, Midwest n=2, Wheatbelt n=1, North Metro n=1) and one case (South Metro) had a known travel history. Two of the remaining five cases were able to be interviewed and both were locally-acquired. This included a chef from the Midwest who prepared goat meat products which were sold at a North Metro market. They had not travelled overseas or eaten out during their incubation period. No association was identified with the other interviewed case who was from South Metro. No hypothesis for the cause of illness could be established.

## *Salmonella* Saintpaul

In January-February 2018 there were 21 cases of *S*. Saintpaul compared to the five year average of 10 cases for the same period. The median age was 22 years with 57% males, 43% females and 71% resided in metropolitan Perth. Three cases were hospitalised. Of the 21 cases, 12 were interviewed and no hypothesis for the cause of illness could be established. PFGE was performed on 11 isolates and six different PFGE types were identified.

## *Salmonella* Singapore

From January to March 2018 there were 10 cases (60% male and 40% female, median age 47 years) of *S*. Singapore notified, compared to the historic five year average of 5.6 cases for the same quarter. One case was hospitalised. Most cases (70 %) resided in the suburbs and the semi-rural areas north-east of Perth. Of these 10 cases, five were interviewed but no common food business was identified. No hypothesis for the cause of illness could be established. PFGE was conducted and three different types were identified.

## *Salmonella* Hvittingfoss

There were six cases of *Salmonella* Hvittingfoss notified in February and six cases in March 2018 compared to the historic five-year average of two notifications over this period. Most (75%) were female and 25% were male, the median age was 50 years (range 13-75), and most cases (92%) resided in the Perth metropolitan area either in the northern suburbs (n=4), eastern suburbs (n=4) or southern suburbs (n=3). Four cases were hospitalised. Of these 12 cases, nine were interviewed but no common food business was identified. PFGE subtyping was conducted for six cases and all were indistinguishable and differed from historical cases. These cases reported eating multiple fresh produce items common to at least 5 cases, and two supermarkets chains were each common to 5 cases but from differing outlets. No hypothesis for the cause of illness could be established.

# Non-foodborne disease outbreaks and outbreaks with an unknown mode of transmission

There were 28 outbreaks of enteric disease in this quarter that appeared to be non-foodborne (Table 6). Of these, 25 outbreaks were ascribed to person-to-person transmission, two were probable environmental transmission and one outbreak had an unknown mode of transmission. A total of 535 people were affected in these 28 outbreaks.

Table 6: Outbreaks with non-foodborne transmission, 1st Quarter 2018, WA



1 Not all cases are diagnosed with the pathogen

2 Deaths temporally associated with gastroenteritis, but contribution to death not specified

## Person-to-person outbreaks

Of the 25 non-foodborne outbreaks that were suspected to be due to person-to-person transmission, 20 (80%) outbreaks occurred in RCFs, three (12%) were in child care centres, and two (8%) in hospitals. The causative agent for 16 (64%) of these outbreaks was confirmed as norovirus, while the causative agent for the remaining 9 (36%) was unknown, due to specimens not being collected (n=4), or specimens being negative for common bacterial and viral pathogens (n=5).

A total of 468 people were affected in these 25 outbreaks, with nine people hospitalised and one death. The number of person-to-person outbreaks in the 1Q18 was 22% lower than the first quarter 5-year mean (n=32).

## Outbreaks with unknown mode of transmission

There was one outbreak in this quarter with an undetermined mode of transmission, with six people ill.

## Restaurant (outbreak code 02/18/SIR)

Of five adults and three children from three different households who ate together at a restaurant at approximately 5:30 pm on 21/2/18, four adults and the two children became unwell with vomiting and/or diarrhoea 30 min to 2.5 hours after beginning the meal. No specimens were collected for testing. Symptoms included diarrhoea (6/6), vomiting (6/6), abdominal cramping (4/4), nausea (4/4), lethargy (3/4), and fever (2/6). The duration of diarrhoea was 1-2 days, and duration of vomiting was once to ~24 hours. There were no reports of bloody diarrhoea and no cases were hospitalised. Foods eaten by all ill people, but not the two well people, included the pasta salad, potato bake and dessert bar. The group had not eaten together in the two weeks prior but had met daily before the dinner. They were not aware of any ill contacts. Local government officers inspected the food business and no major non-compliances were identified. Elevated levels of *Bacillus cereus* were reported in a pasta salad sample collected from a separate batch to that eaten by the group. This was not consistent with the symptomology of this group but suggested possible inadequate cooking or storage conditions. Aetiology and mode of transmission was unknown.

## Probable environmental disease outbreak

There were two outbreaks in this quarter that were suspected to be caused by exposure to a contaminated environment, with a total of 61 people ill.

## Restaurant, norovirus (outbreak code 03/18/WWW)

An outbreak of gastroenteritis occurred after a wedding reception held at a winery on 10/3/18. At least 47 people became ill following the function, with a median incubation period of 33 hours and median duration of 2 days. The symptoms, incubation period and the duration of illness experienced were suggestive of norovirus infection. The one faecal specimen collected was positive for norovirus. An analytical study did not identify a statistical association between foods eaten and becoming ill. The local government investigation identified numerous non-compliances with the Food Act 2008. The outbreak was most likely due to environmental norovirus contamination of the venue.

## Restaurant, norovirus (outbreak code 03/18/WWP)

An outbreak of gastroenteritis that occurred after a wedding reception held at a winery, on 17/3/18. This was the same venue as 03/18/WWW. At least 14 people became ill following the function, with a median incubation period of 32 hours and median duration of 2 days. The symptoms, incubation period and the duration of illness experienced were suggestive of norovirus infection. Two faecal specimens collected were positive for norovirus. An analytical study did not identify a statistical association between foods eaten and becoming ill. The local government investigation identified numerous non-compliances with the Food Act 2008. The outbreak was most likely due to environmental norovirus contamination of the venue.

# Site activities

During the first quarter of 2018, the following activities were conducted at the WA OzFoodNet site:

* Ongoing surveillance of foodborne disease in WA.
* Monitoring culture-independent nucleic acid amplification diagnostic testing in private laboratories and impact on notification rates.
* Investigation of nine foodborne outbreaks, including one outbreak as part of a multi-jurisdictional outbreak investigation.
* Investigation and monitoring of 25 person-to-person gastroenteritis outbreaks, two environmental outbreaks and one outbreak with an unknown mode of transmission.
* Ongoing investigation of the community-wide increase in *Salmonella* Typhimurium MLVA 03-17-09-12-523, and investigation of eight other clusters.
* Part of an inter-agency working group developing the WA Foodborne Illness Reduction Strategy that will be used to try and reduce the record levels of foodborne salmonellosis.
* Interviewing *Salmonella* Enteritidis cases regarding travel status and attempting to identify risk factors in locally acquired cases.
* Participation in monthly national OzFoodNet teleconferences.
* Provided enteric disease data, interpretation and advice upon request to local government environmental health officers, laboratory and public health unit staff.
* Attended the national OzFoodNet face-to-face meeting in Sydney in March.
* Provided feedback to OzFoodNet on a CDNA out-of-session item requesting nominations for diseases that the Animal Health Committee should consider for inclusion on the list of notifiable diseases in animals.
* Drafted and coordinated the OzFoodNet/CDNA submission to the Food Regulations Standing Committee’s consultation document on the *Development of Australia’s Foodborne Illness Reduction Strategy 2018-2021+*.
* Together with the Food Unit, conducted foodborne outbreak investigation training for environmental health officers and public health nurses in metropolitan Perth in February.
* Membership of OzFoodNet and other National working groups on:
  + Foodborne disease tool kit
  + Series of National Guidelines
    - Hepatitis A
    - *Shigella*
  + Antimicrobial resistance in *Salmonella* isolates from egg laying environments.

# References

1. Hall G, Kirk MD, Becker N, Gregory JE, Unicomb L, Millard G, et al. Estimating foodborne gastroenteritis, Australia. Emerg Infect Dis. 2005;11(8):1257-1264.
2. OzFoodNet Working Group. A health network to enhance the surveillance of foodborne diseases in Australia. Department of Health and Ageing 2013. www.ozfoodnet.gov.au/internet/ozfoodnet/publishing.nsf/Content/Home-1 [14/03/2012].
3. Bennett SD, Walsh KA, Gould LH. Foodborne disease outbreaks cause by Bacillus cereus, Clostridium perfringens, and Staphylococcus aureus – United States, 1998-2008. Clin Infect Dis. 2013 Aug;57(3):425-33.

This document can be made available in alternative formats on request for a person with a disability.

© Department of Health 2018